School Shop

vol. XII no. 10
JUNE 1953

A Challenge to Industrial Educators
by G. S. Wall

Meat Tenderizer
by O. R. Beutel

20-Watt Radio Transmitter
by C. R. Thomson

Model Aircraft Engines Unit
by Ralph E. Plant, Jr.

Cover Story: A 30-minute TV program originated recently in the machine shop of the Central High School, Tulsa, Okla., with Instructor H. E. Miller describing the program as the camera moved about the shop, showing students at their work. See page 16 for more information on this program.

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THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

Write Your Congressmen

The national administration's budget, which is now before Congress, calls for a cut of $4½ million in the George-Barden Act appropriation over this year's expenditures under the act. This cut will mean serious curtailment of the program of vocational education in many communities.

Undoubtedly there will be a fight on the floor of Congress over this cut if it comes out of committee as is. Vocational education needs the help given to it under the George-Barden Act if it is to serve adequately the young people of our country. Write your Senators and Congressman today, before it is too late, encouraging them to restore this crippling cut.

Education Takes the Rap

Confidence in the U.S. Office of Education has been rudely shaken by a series of events in the past few months. Educators around the country wonder what they can expect from the national governmental agency that concerns them most. Staff members of the USOE are known to be fearful of their future and of the future of the agency. Much important work has been stopped, at least temporarily, and many fine staff members who have dedicated their lives to the educational well being of the young people of our great country have been thwarted in their efforts to perform much-needed services.

The events that have led to this unhappy state of affairs are probably familiar to SCHOOL SHOP readers but in order to keep the record straight they should be repeated briefly.

The Congress made the Office of Education responsible under the Korean GI Bill for the setting up of a system of accrediting schools which veterans could attend. This assignment evolved on the Office last August when there was no opportunity to get an appropriation from Congress to carry it out. The Budget Bureau had to give its permission to spend the money to set up an extra staff of 40 to 50 people from the Office's regular appropriation with the understanding that the money would be requested in a deficiency appropriation. Apparently the Budget Bureau felt that as long as a Congress had given this assignment to the Office of Education it would appropriate the money to carry out the task.

When Commissioner McGrath appeared before Congress to ask for the $259,000 needed to police Korean GI Bill education and training programs, he was given nothing at all and told to perform the function with already overloaded staff. The result has been that this Congressional economy move has seriously crippled the staff of the Office. In March, 50 professional and clerical staff members were fired, including two valuable members of the Trade and Industrial Education Service. In April nearly 300 staff members took several payless leave days in order to make up the deficit in operating funds.

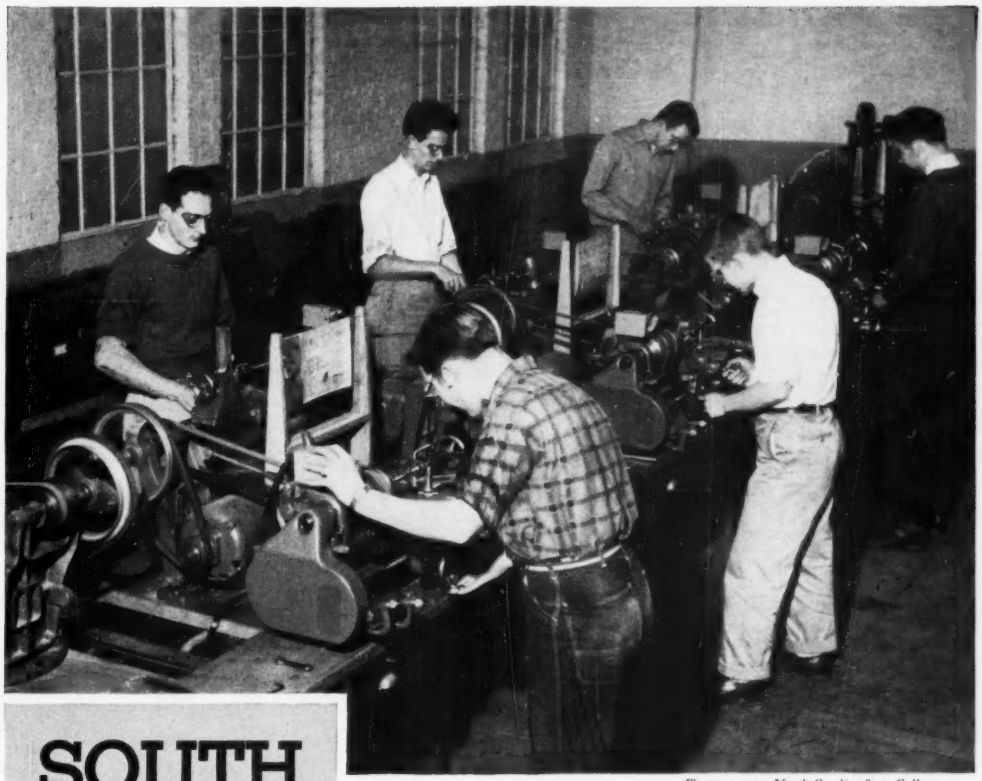
No help came from the new Secretary of Health, Education, and Welfare, Mrs. Oveta Culp Hobby. She remained mum while the USOE wrestled with its problems. Finally, Commissioner McGrath resigned in protest over budget cuts.

The hostility toward the Office of Education as shown by the Congress and the lack of support shown by the new secretary indicate a crass interest in economy in an area where one of the Nation's greatest resources is at stake—its children.

The effects of this crippling blow will be felt for a long period of time. Lack of Congressional support will mean that the Office will have difficulty recruiting staff members because of the uncertainty of its programs. Unless the new Secretary shows considerably more interest than has been demonstrated so far in the Office, educators will look in vain for the type of leadership that a cabinet position could give.

Economy is desirable but not false economy which cripples small agencies given large tasks to perform in the field of our greatest national resource—our youth.

When minimum budgets are slashed, mouths are ordered closed, and the education of our young is hindered, the time has come to register a vigorous protest.—*L. W. P.*



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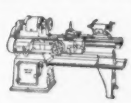

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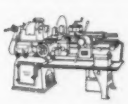

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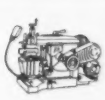

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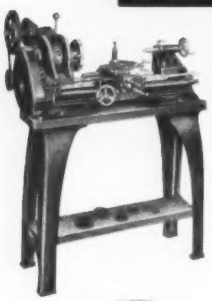

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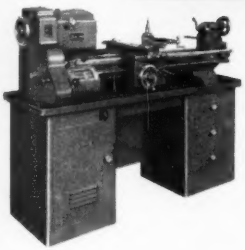

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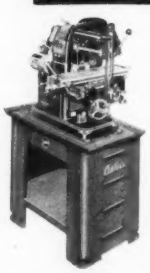

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A Challenge TO INDUSTRIAL EDUCATORS

By G. S. Wall

Associate Professor of Education,
The Stout Institute, Menomonie, Wisconsin

TO begin abruptly, it is my belief that education in a democracy should be unitary and consequently there should not be many kinds of education. In fact, it may be stated categorically that in a democracy there is a place for only one kind of EDUCATION*, period. Let me hasten to state that this is not advocating that one of the existing kinds of education shall become *it*. In fact, each of the two major existing kinds of education will simply serve to satisfy two of the three major functions of EDUCATION. These are presented later.

The readers of SCHOOL SHOP will recall that many writers, including those in our special field, have expressed the idea that education is all encompassing. The completeness of coverage necessary was implied by Mort when he wrote on the concept of equality in education to the effect ". . . that no individual should be handicapped in the race for life. In its educational application, it may be interpreted as demanding that no child shall be given an educational training less than reasonably required to fit him for life as a contributing member of society."[1]

Originally, education was all-encompassing because life was relatively simple. It was easy to include all of the *general* as well as the *special* skills, knowledges, and attitudes needed to become a contributing member of society. In comparison to today, it was not difficult for the individual to make the necessary choices and decisions concerning life.

However, the complexity of the world today has brought about a need for specialization. The need for certain general basic and fundamental skills, knowledges, and attitudes still exists together with a need for similar qualifications in one of the many special aspects of work life. This has led to the educational dualism which is very much in evidence today. Many educators simply recognize the two areas, whereas others go to the extreme of creating the "civil war" expressed by *general* vs. *special* education. It must be stated, however, that all do not think of the educational dualism as such even though they recognize the existence of two kinds of education. Keller, for example, recognizes the two by writing that ". . . there is a general education for everybody and a special education for everybody."[2]

But, it is reasonable to conclude that Keller does not think of them as dualistic for he continues by writing: "There is a common social development for everybody and a particularized individual vocational development for everybody. Since these educations are for everybody they must be available for everybody."[3]

One cannot help but reflect on Benjamin's ". . . somber warning that education is always education and that he who would make it all guidance, all measurement, all curriculum, all activity or all any other instrument [as all general or all special] has fallen from the status of educator . . . ."[4]

Unfortunately, the extremists in the dualism in education today have come to the point where the "civil war" does not permit them to see that every subject ". . . may be taught as special or general education, depending on the choice of content and the emphasis on method."[5]

Education Is Unitary

To attain this highly desirable goal we must conceive an EDUCATION which is a unitary process, one which strives toward dual-valves, one which is *not* dichotomous. EDUCATION should be as singular as are the *individuals* we strive to EDUCATE.

The EDUCATION conceived here is graphically presented in Figure 1, in which EDUCATION is an integral part of life, it being a process through which

*Note: EDUCATION, in all capital letters, will be used here to refer to this concept.

[1]Paul R. Mort, *Principles of School Administration*, New York: McGraw-Hill Book Company, Inc., 1946, p. 153.

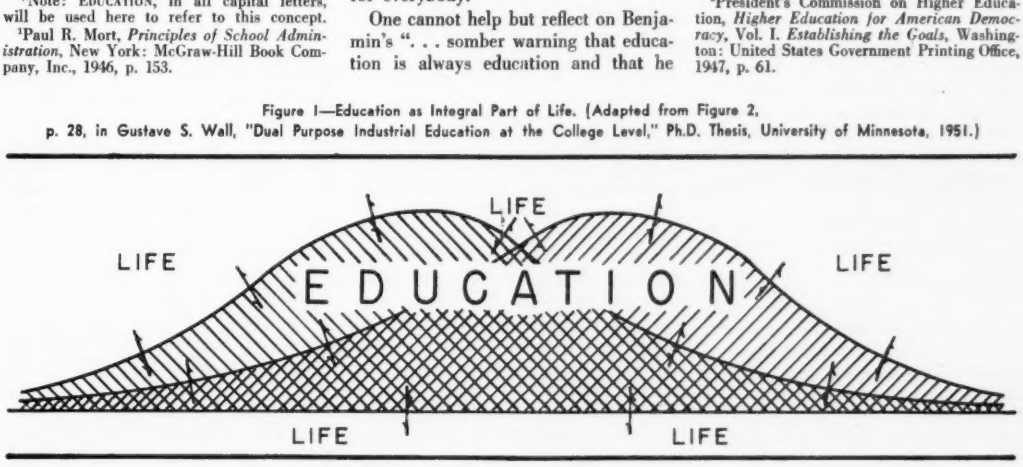
[2]Franklin J. Keller, "Vocational Education for American Life" in *Forty-Second Yearbook, Part I, Vocational Education*, National Society for the Study of Education, Chicago: University of Chicago Press, 1943, p. 8.

[3]*Loc. Cit.*

[4]Harold Benjamin, in the "Editor's Introduction" to George E. Myers, *Principles and Techniques of Vocational Guidance*, New York: McGraw-Hill Book Company, Inc., 1941, p. xii.

[5]President's Commission on Higher Education, *Higher Education for American Democracy*, Vol. I. *Establishing the Goals*, Washington: United States Government Printing Office, 1947, p. 61.

Figure 1—Education as Integral Part of Life. (Adapted from Figure 2, p. 28, in Gustave S. Wall, "Dual Purpose Industrial Education at the College Level," Ph.D. Thesis, University of Minnesota, 1951.)



we aim to develop youth in both the *general* and *special* skills, knowledges, and attitudes necessary for complete, worthwhile membership in our society. This unity is brought about through the third function of EDUCATION, that of *guidance*, which amalgamates the *general* and the *special* development functions and also relates them to life outside of the school.

That guidance is a part of education may be readily accepted. The significance of this has been aptly expressed by Jones who in writing on the subject of "Guidance and Education" presented the concept which:

> . . . practically identifies the purpose of guidance with that of education. It places major emphasis upon the development of the whole individual who is now functioning and will in the future function in a social environment . . . it stresses the unity of one's life and reveals the impossibility of separating one aspect of life from another . . . One of the most vital elements in our efforts to educate individuals is the assistance we give in connection with choosing and developing these life purposes and goals.[6]

Based on the very brief presentation above, we find that EDUCATION has three functions, namely: (*a*) to develop the *general* requirements, (*b*) to develop the *special* requirements, and (*c*) to render assistance—*guidance*—so that all will become worthwhile, contributing members of society. The distinction to be noted here is that it is simply EDUCATION, a single process of development; not two separate processes in each of which the zealots are prone to divorce one from the other. Let it also be stated that EDUCATION conceived to serve these three functions does not mean that every subject or area will contribute equally with each other to the three functions, for admittedly some are by their very nature much better adaptable to one or the other. Every EDUCATOR would be just that, one who serves each of the three functions of EDUCATION although the emphasis will vary among them. Some EDUCATORS would be specialists in *general* development, some would specialize in the *special* (vocational) development; but, *all* would serve both functions because *all* would be *guidance* workers.

Based on Industry

This unitary process can be carried on, as will be presented later, especially well in the area of EDUCATION based on industry. This does not imply that it would not function in other areas—traditional "kinds"—of education. Limitation is made here simply to confine the illustration to the area of primary interest to the readers of SCHOOL SHOP.

Industrial education as it is conceived today is a natural unitary educational area for it is claimed, through industrial arts, to be *general* in purpose, and, through vocational-industrial, to be *special* in purpose. One thing on which we will probably all agree is that the content for both comes from a common source—industry. It is the content which makes it a natural unitary educational area. It appears, then, that the difference between the two present phases is in the emphasis and the method.

In the extreme, some of the "generalists" through industrial arts would deemphasize the manipulative skill content to the point where it would be virtually nil; the technical knowledge would be accorded a substantial recognition; and the *general* knowledge about industry would be stressed. Similarly, the "specialists" would reverse the above situation. The extremists would attach no, or very slight, significance to the *general* knowledge about industry; a significant emphasis would be given to the technical knowledge; and a great deal of emphasis would be given to the manipulative skill content. To state it simply—the "generalists" would serve no *special* purpose and the "specialists" would serve no *general* purpose.

Even at the risk of being accused of attempting to bring about mediocrity, it is being advocated here that we as EDUCATORS would be rendering a far greater EDUCATIONAL service to our youth if we would strive toward utilizing the natural dual-function of this area in EDUCATION. In fact we could well serve as the vanguard for a truly unitary, democratic EDUCATION. In all fairness it should be stated that many of you are now doing something along this line. If you are, then you are an EDUCATOR.

Let us not be extremists and claim either by word or practice that industrial arts cannot serve youth as preparation for a *special* or *vocational* aspect of life simply because it is *general* education. Neither should we lay claim to any statement or action which conveys the thought that the area of education we call vocational-industrial cannot serve youth in any *general* development simply because it is *special*. Such extremes are simply arbitrary and fallacious. The outcomes belie the extremist's arbitrary goals. "Doing what comes naturally" should not be frowned on simply because it has been decreed as unwanted. This is especially to be desired if it provides real EDUCATION.

Industry the Core

Assuming another risk for the sake of brevity, the following is presented in an overly simplified manner to reveal the natural unitary character of our content, which stems from industry and makes up the industrial area in EDUCATION.

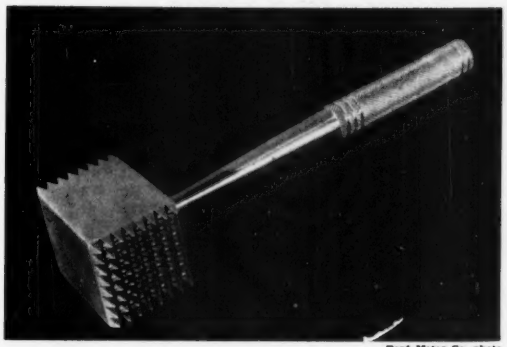
Industrial education to begin with should better be thought of as simply one of many areas in EDUCATION. Because it serves both of the major functions of EDUCATION it may well be written: ARTS ← INDUSTRIAL → VOCATIONAL. In this, industry is given its rightful place, the center of the core; yet it is recognized as serving both the *general* and the *special* phases of EDUCATION.

Industry provides us with two major classifications of content for our work, namely, skills and knowledges. On the assumption that you cannot strip *industry* completely of either the manipulative skills practiced in it or the technical knowledges needed in it and still have a true representation that we could rightly call *industrial*, it must be conceded that such skills and knowledges must be in the content selected for either kind of development. Further, it may be assumed that knowledge *about industry* is desirable for all members of society for the simple reason that we are an *industrial* nation. Still further, since it is recognized that we are concerned with educating individuals—human beings and not automatons—we must give consideration to the development of desirable habits and attitudes in all students, without regard to whether they are receiving *general* or *special* development. Here, again, it may be stated categorically that both the *general* and the *special* functions of EDUCATION must serve to develop desirable *attitudes*.

The above presents the major objectives toward which we strive in EDUCATION. The objectives of the area ARTS ← INDUSTRIAL → VOCATIONAL are concerned with development and/or acquisition of skills, knowledges, and attitudes through the content derived from *industry*. Obviously these major categories imply that when the emphasis is primarily on *special* development the overall purpose is for earning a living. Contrariwise, if the emphasis is primarily on *general* development these same skills, knowledges, and attitudes will serve in the overall area of living. However, it should be remembered that in each instance there is a secondary emphasis. Let's not try to eliminate this secondary emphasis in our zeal to do a good (?) job!

(*Continued on page* 20)

[6]Arthur J. Jones, *Principles of Guidance*, New York: McGraw-Hill Book Company, Inc., 1945, p. 68.



Ford Motor Co. photo

Lathe work, shaping, and milling can be learned by the student when making this attractive project which has real utility in the kitchen.

Here is a prize-winning take-home project that mother will like

Meat Tenderizer

By O. R. Beute

Head, Industrial Arts Department,
Diablo High School, Concord, California

STUDENT interest is captured by this machine-shop project which is unusual in design and will impress mother greatly.

The project gives the instructor an opportunity to demonstrate three basic machine tools.

The lathe operations include setting up work between centers, plain turning, knurling, taper turning, cutting threads, and using a form tool. In using the miller or the shaper in making the head, the beginning student must first become familiar with the various parts of the machine and their functions, safety precautions, speeds, feeds, and other operations.

The advanced student will find a new experience in using the shaper or the miller to cut the pointed ends of the head. If both machines are used, the student will be able to evaluate and compare the advantages of each.

As can be seen from the drawing, one side of the head has a number of points on it while the other has a series of sharp ridges.

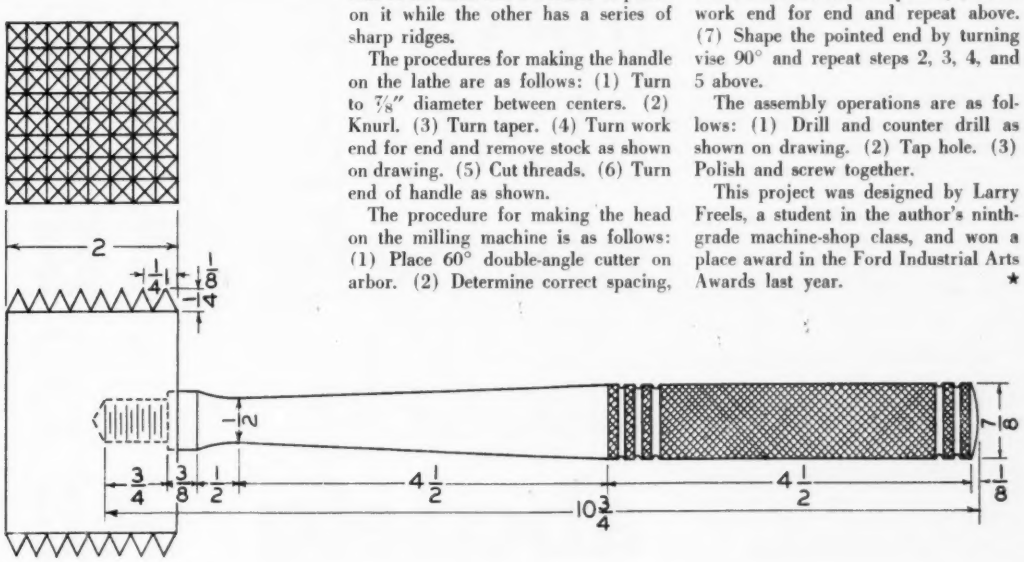
The procedures for making the handle on the lathe are as follows: (1) Turn to $\frac{7}{8}$" diameter between centers. (2) Knurl. (3) Turn taper. (4) Turn work end for end and remove stock as shown on drawing. (5) Cut threads. (6) Turn end of handle as shown.

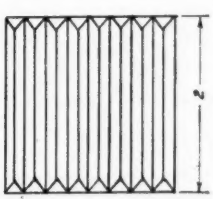
The procedure for making the head on the milling machine is as follows: (1) Place 60° double-angle cutter on arbor. (2) Determine correct spacing, depth, speed, and feed on a sample piece of aluminum. (3) Place head in milling-machine vise and cut ends as shown.

The procedure for making the head on the shaper is as follows: (1) Grind tool bit to correct angle. (2) Position tool bit over work in shaper vise. (3) Feed tool bit down slowly into work to a depth of approximately $\frac{1}{4}$". (4) Raise tool bit above work and turn hand feed .250". (5) Repeat step 3 until entire area has been shaped. (6) Turn work end for end and repeat above. (7) Shape the pointed end by turning vise 90° and repeat steps 2, 3, 4, and 5 above.

The assembly operations are as follows: (1) Drill and counter drill as shown on drawing. (2) Tap hole. (3) Polish and screw together.

This project was designed by Larry Freels, a student in the author's ninth-grade machine-shop class, and won a place award in the Ford Industrial Arts Awards last year. ★





BILL OF MATERIALS

HANDLE	ALUMINUM 61ST 6	1 DIA X 10 7/8
HEAD	ALUMINUM 24ST 4	2X 2X 3 1/4

TYPE FACES

number almost 1,500 different designs, but most fall into ten classifications below. Learn them to help to tell one basic design from another.

By R. RANDOLPH KARCH, author of *How to Recognize Type Faces*

Look for differences in designs shown below by comparing the shape of serifs, widths of letters, weight of face, contrast of strokes, design of cross strokes, length of the ascenders and descenders and design of the lowercase g.

BLACKLETTER–First Type Style Patterned after hand script of ancient scribes. Represented here in *Cloister Black*. Dates from 1450.

abcdefghij AB

VENETIAN–The First Roman Type. Designed by Nicholas Jenson, Italy, about 1470. Represented here in the *Cloister* face.

abcdefg AB

FRENCH OLDSTYLE–Designed by Jean Jannon, France, about the year 1530. Represented here in *Garamond* type style, after Claude Garamond.

abcdefg AB

ENGLISH OLDSTYLE–Designed by William Caslon, about the year 1722, in England. Represented here in the *Caslon* type style.

abcdefg AB

TRANSITIONAL–Designed by John Baskerville, in England, about the year 1752. Represented here in the *Baskerville* face.

abcdefg AB

MODERN–Designed by Giambattista Bodoni about 1789, in Italy. Represented here in one of the many versions of the *Bodoni* type face.

abcdefg AB

"GOTHIC"–Actually misnamed, and various designs appeared in 1900. Represented here in *Franklin Gothic*, designed by M. F. Benton, America.

abcdefg AB

SANS SERIF–This version, designed first by Rudolf Koch, in Germany in 1926, is called *Kabel*. Many other designs are popular.

abcdefg AB

SQUARE SERIF–Redesign from early Antiques. Shown here in the *Memphis Bold* style, by Rudolf Wolf, in 1930. From the original *Girder* style.

abcdefg AB

SCRIPT–After handwriting, appeared in the 1880s; joining and non-joining letters. *Artscript* is shown here, designed by Sol Hess, America, 1940.

abcdefghij AB

[NOTE: Reprints of this page and of the two previously published articles in this series ("Spaces and Quads," Feb. issue; "Word Spacing," May issue) can be secured for class notebook or bulletin-board use from SCHOOL SHOP, Ann Arbor, Michigan, for 5c each in quantities of 10 or more.]

A prize-winning

20-Watt Radio Transmitter

By C. R. Thomson

Waite High School, Toledo, Ohio
(W8JEX; W8ZKS)

USEFUL projects are essential for developing interest — one of the necessary factors for successful achievement. This 20-watt transmitter project offered an opportunity for the student to see some real value, thereby holding his attention and interest much better than mere practice jobs. The project was carefully studied in terms of use, value, design, and student interest.

In organizing this project, a job analysis was made. The subject was first broken down into a list of things the student should know how to do. The project was selected and a group of three units was constructed around the project: (1) the power supply; (2) the radio-frequency section; and (3) the audio-frequency section.

The project was revised at intervals to meet certain conditions as to materials on hand and available in our shop. Several such projects were built by students in the radio class.

The complete transmitter project shown and described in detail was built by Willard Shears, a junior at Waite High School, and won a first prize in the Ford Industrial Arts Awards. The time required for the complete job was one semester of seven periods per week. The project included wood work as well as radio work.

The crystal oscillator is a Pierce oscillator using a 7C5 tube. Plate voltage to this tube is supplied through the 2.5 mh choke and its output is fed to the grid of the amplifier through a .0001 mfd condenser. The plate of the 6L6 r-f amplifier is shunt fed, having its plate voltage supplied through a 2.5 mh choke and its output fed through the tuning coil and condenser circuit to the antenna. By using this type of antenna coupler, it is possible to use almost any length of wire as an antenna. The 0-100 d-c milliammeter in the r-f amplifier provides for resonant tuning.

Ford Motor Photo

The front panels are aluminum with a crackle finish and the case is made of mahogany ply.

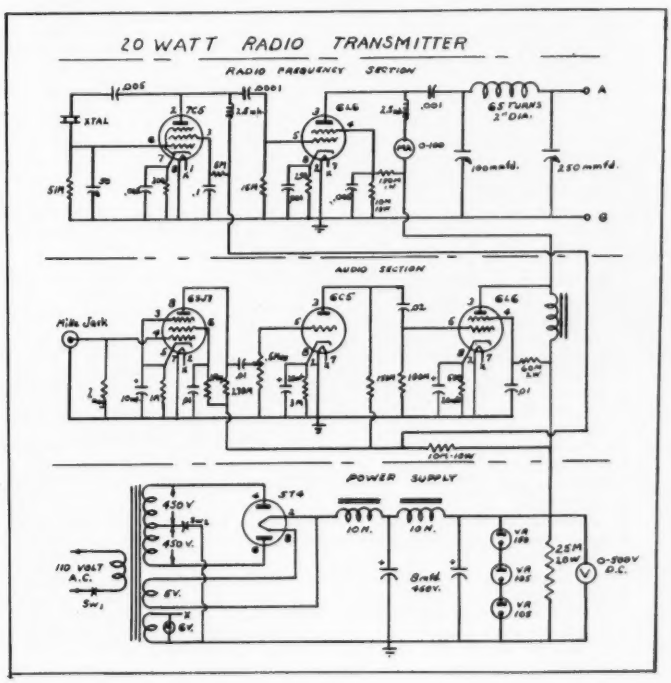
The speech amplifier and modulator are of conventional design. Class A modulator using an inexpensive a-f choke coil was used, instead of Class B modulation, in order to eliminate the cost of input and output transformers.

The power supply is made of a standard receiver type power transformer, condensers, and choke coils. Voltage regulation tubes are used in order to maintain steady plate voltages on all the tubes.

Both power supply and transmitter are mounted on an aluminum chassis. The transmitter is mounted over the power supply in rack fashion. The rack-type cabinet was constructed from ¼" mahogany plywood and ¾" square wood frames.

The inside of the cabinet was painted with a conducting type of silver paint in order to provide shielding to help eliminate television interference. The outside finish of the cabinet is hand-rubbed mahogany. The panels were made of ⅛" aluminum plate and finished in gray crackle. Most of the material used in this transmitter was government surplus. The tubes, tube sockets, condensers, resistors, coils, meters, and plywood for the cabinet were all government surplus materials. Some of it had to be removed from various types of army radio equipment. The transformers and choke coils were not available from surplus material at our disposal.

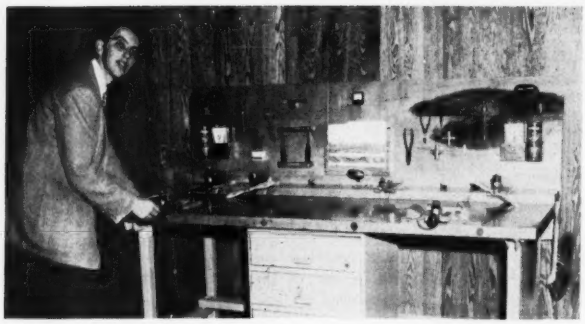
We have had very good success with this low-power transmitter. We have been able to talk to many different radio amateurs in several states. The reports have always been very satisfactory. It is designed to work in both the 160-meter amateur phone band and the 80-meter amateur phone band. ★



A Teaching Unit in Model Aircraft Engines

By Ralph E. Plant Jr.

Student of Industrial Arts,
State Teachers College, Oswego, New York



This area development was designed to give pupils experience with model aircraft engines. Types of engines on the bench include diesel, ignition, and glow-plug type.

THE average general shop is too small to include the complete equipment necessary to offer experience with gas and diesel aircraft engines. One method of giving pupils this experience without extensive equipment is through the use of model or miniature aircraft engines. The photograph on this page shows an area development designed for this type of activity.

Of course, if space allows, regular engines could be used to supplement this area. The average junior-high-school boy, however, may find the full-scale engines somewhat overwhelming.

One of the big problems in a shop is how to keep the students interested. Experience in overhauling various types of small engines has been proved to sustain student interest at a high level. In the area shown, there are six model engines, including one diesel engine, two ignition-type engines, and three glow-plug type engines.

The following area outline can be used in teaching a unit on model aircraft engines:

Model Aircraft Engines

I. Basic Principles of the Model Aircraft Engine.
  A. Reason why the model engine makes a good power plant for model airplanes:
    1. Supplies strong and constant power.
    2. Power duration is limited only by the size of the fuel tank.
    3. Weight is concentrated at one point in the airplane.
  B. Basic elements of all model engines:
    1. Mechanical system.
    2. Electrical system.
    3. Fuel and lubricating system.
  C. Classification of engines:
    1. Four cycle. Developed into a practical engine about 1876 by Dr. N. A. Otto. Not very practical for model airplanes.
    2. Two cycle. Developed by Sir Dugald Clerk about 1878.
      a) Advantages:
        (1) High power to weight ratio.
        (2) Not as heavy as the four-cycle.
        (3) Fewer moving parts.
      b) Disadvantages:
        (1) Wasteful of oil.
        (2) Oil burns in cylinder, fouling plugs and leading to carbon deposits on piston and cylinder walls.

II. Types of Model Aircraft Engines.
  A. Ignition type—most widely used up to 1947.
    1. Ignition timer—a device that operates to open and close the ignition circuit at equal time intervals at a precise position of the crankcase during each revolution.
    2. Condenser—an aid in keeping the current flowing steadily.
    3. Coil—an apparatus used for producing high voltage.
    4. Batteries—used to supply electrical energy. Three volts used.
    5. Spark plug—for igniting the compressed fuel mixture in the cylinder.
    6. Wiring—stranded copper wire.
    7. Fuel—a mixture of white gas and No. 70 oil, three or four parts gas to one part oil.
  B. Glow-plug type engine—better suited for a model airplane because it runs without the added weight of batteries, coil, and condenser.
    1. Glow plug—same size as the spark plug but a coil of alloyed wire (nichrome) is the heating element.
    2. Glow-plug element heated by a 1½-v dry cell.
    3. Fuel—98 percent methanol alcohol and 2 percent lubricants.
  C. Diesel engines—developed by Dr. Rudolph Diesel in 1892.
    1. Much heavier than the ignition or glow-plug type engine.
    2. Runs on cheap oil.
    3. Has lower running speed.

III. Operation of the Model Engine.
  A. Source of power is compressed fuel which expands violently on ignition.
  B. Four principal steps in the action of a two-cycle engine:
    1. Intake stroke.
    2. Compression stroke and ignition.
    3. Power stroke.
    4. Exhaust stroke.
  C. Starting the engine:
    1. Ignition type
      a) Make sure fuel tank is full and fuel line is not clogged.
      b) Batteries should give off three volts.
      c) Check to see if a spark will jump from the high-tension lead to the spark plug when the prop is flipped.
    2. Glow-plug type
      a) Take out plug and see if it will glow.
      b) Use only a 1½-v battery.
    3. Gas and oil should be filtered before put in tank.
    4. Make sure all connections to and from battery are soldered.
  D. Breaking-in period.
    1. Do not bench run more than one minute because engine cannot be cooled properly.
    2. Break-in period usually lasts about two hours of slow running.

IV. Care of the Engine.
  A. After flying on a dusty day, the engine should be cleaned inside and out with gasoline.
  B. Model engine "don'ts".
    1. Don't run engine just to hear it run.
    2. Don't make hasty repairs on the field.
    3. Don't use lean mixtures (upwards of four to one) or so-called "super fuels" just to see what will happen.
    4. Don't exchange similar parts with other engines.
    5. Don't run the engine with an unbalanced propeller.

List of Manufacturers of Model Engines, Kits, and General Supplies

Engines:

Atwood Manufacturing Co., Pico, Calif. (Atwood Champ).

Herkimer Tool & Model Works, Herkimer, N.Y. (OK).

Duro-Matic Products Co., 8509 Higuera St., Culver City, Calif. (McCoy).

Ohlsson & Rice, Inc., Emery at Grand Vista, Los Angeles 23, Calif. (O&R).

K & B Manufacturing Co., 224 E. Palmer Ave., Compton, Calif. (Torpedo).

Airplane kits and general supplies:

Comet Model Hobbycraft, Inc., 501 W. 35th St., Chicago 16, Ill.

America's Hobby Center, Inc., 156 W. 22nd St., New York 11, N.Y.

A-J Aircraft Co., 1166 N.E. 31st St., Portland 12, Ore.

Cleveland Model and Supply Co., 4506 Lorain Ave., Cleveland 2, Ohio.

Monogram Models, Inc., 3421 W. 48th Place, Chicago 32, Ill.

(*Continued on page* 18)

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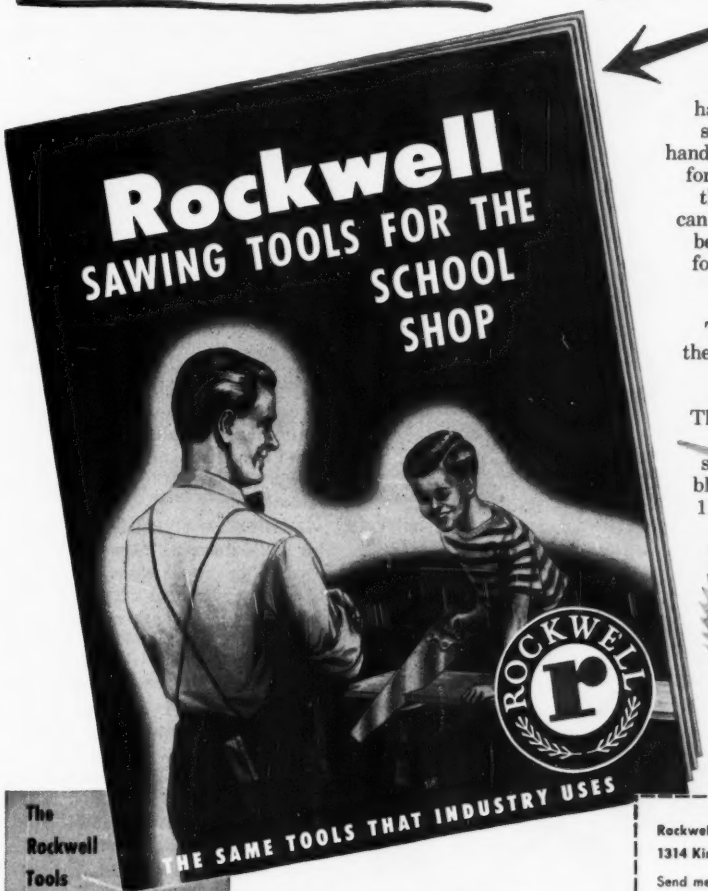

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Diamond Dust

Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

Life at a Conference—or Individual Differences Afield

If you have been lucky, you have attended one of the summer conferences for industrial educators held around the country in spots like Lake Tahoe, Jackson's Mills, Leland, or Hot Springs. These conferences are perennial events that do much to develop a professional esprit de corps among those who attend. They give an opportunity to the participants to test out their bright ideas against the sounding board of public opinion, as represented by others who are also searching after wisdom.

However, there are moments when we have doubts as to the real purpose of the sessions. These doubts have been aroused by the fact that people view them differently. From the standpoint of the unbiased onlooker, it appears that the individual differences among those who attend are quite marked.

For example, there are some who show considerable interest in attending the meetings. On the other hand, there is just as wide variation in the enthusiasm of others in their efforts to avoid what they have come to look on as the misfortune of stumbling into a meeting.

Then there are the young bloods who amble forth in the evening seeking victims of the opposite sex with whom to trade lies. Be it said of these eager youths that occasionally they get hooked, and, before they are aware of what is happening to them, they are marching up the aisle.

And let us not forget the old coots who spend their evenings in the local bistro inhaling various and sundry liquid concoctions. This pleasant occupation befogs what they use for a brain, which, in turn, inflates their ego to the point where they make eyes at the young ladies who appear to infest these dens of iniquity. If by chance the maidens respond to the advances, a coalition is formed which convinces the old fellow that he still has what it takes. The d-----d old optimist!

Then there are those who seem to have the feeling that they are exempt from any activity that involves work. They talk glibly about what is wrong with the conference, but they carefully avoid any effort on their part to rectify what they believe to be wrong. These individuals might be likened to the drones who are ejected from the beehive because of their indolent habits. However, as the more industrious members of the group wend their weary way toward a meeting, one can almost hear the sigh of regret, "Oh, that I had been born a drone."

These individual differences appear also in the form of entertainment engaged in by the brethren. The more sedate among them sit solemnly around the bridge table and confuse their partners by bidding Blackwood when their partners are thinking in terms of Culbertson. This leads to recrimination, which in turn destroys the happy, "don't-care-a-continental" spirit that ought to prevail in any game.

Then there is always a select group who spend their time in seclusion. These individuals retire to some remote cottage or room for the purpose of building a pair of treys into a full house. The game they play is an intricate one. It changes constantly until the bystander, who is privileged to kibitz, never knows what is happening at any given time. The players may be spitting in the ocean or playing baseball, but one never gets a view of the water, and there is a noticeable absence of baseball equipment. It is in this group that the socialistic aspects of the conference become most apparent—

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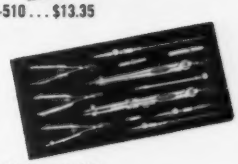

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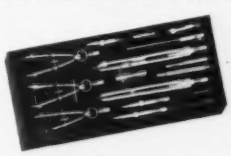

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the "haves" always seem eager to share what they have with the "have-nots."

Another difference appears when one considers the plight of those thoughtful souls who are accompanied by their wives. They are different in that they cannot be trusted away from home alone. The little woman, knowing friend husband's weakness, comes along for the purpose of riding herd on him. At any rate we can always be sure these gentlemen will be at the meetings in the morning. Being on a leash, however, they stay put in the evening when everyone knows they are eager to join the more informal activities engaged in by their bachelor friends. It might be going a little too far to say that they envy the aforementioned friends, but, if the whole truth were known, as they mutter in their beards they are dreaming dreams of a large evening with the boys over a liberal pitcher of suds.

Nor must we forget those conferees who spend the major portion of their time on the golf course. As a rule they have their equipment cached conveniently outside the meeting place, and, without waiting for the benediction, they hie themselves forth with much clattering of clubs. If you have had the doubtful privilege of following them around the course, you will be convinced that the truth is not in them.

To people who are broadminded, tearing up the turf may not be considered a crime, but unfortunately it is not the only criterion on which to form one's judgment on their game. It would seem that these so-called golfers cannot count above six, that being the upper limit of their ability in arithmetic. They concede themselves ten-foot putts on the ground that it would be an insult to the player to assume that anyone would miss the cup at that distance. But that is not the worst of it. When, in due course, the dinner hour arrives and the more thoughtful of the members feel inclined to discuss the profound truths that have been uttered at the meetings, they are completely frustrated by having to listen to the game being played all over again.

Regardless of all these differences in personalities, interests, abilities, and activities at conferences, everyone has a good time. We have been pleased to note, too, that, with the exception of a few perennial loafers, each individual participates in the real business of the conference with a seriousness of purpose which is indeed admirable. It is believed that much good will results from the various activities, both social and professional, but it should be kept in mind that the extent of this good to each individual is in direct relationship to the contribution he makes to the affair. ★

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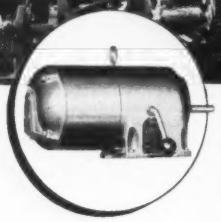
Specifically designed to individually motorize machine tools originally driven by lineshaft, LIMA GEARSHIFT DRIVES were selected by Ohio State University to provide its students with the very best in modern machine shop equipment.

Ohio State is but one of many schools throughout the nation that have modernized their machine shops with LIMA DRIVES, providing the utmost in functional safety, adequate lighting, proper machine location and the complete elimination of hazardous lineshafting.

Ohio State's completely modernized Industrial Engineering Department



• *Selective Speed* LIMA GEARSHIFT DRIVES for application to all types of machine tools and production equipment are built in sizes from ½ to 15 HP.

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THE LIMA ELECTRIC MOTOR COMPANY 2651 FINDLAY ROAD • LIMA, OHIO

AIAA Meets in Detroit

WITH the largest attendance of any meeting of the American Industrial Arts Association, the 15th annual convention of the association was held in Detroit, Michigan, April 28 to May 2.

Announcement was made of the election of Fred J. Schmidt, Jr., head of the department of industrial arts at Ball State Teachers College, Muncie, Indiana, as president to succeed Gordon O. Wilber and of J. Ely Van Hart, supervisor of industrial arts, Elizabeth, New Jersey, as vice-president.

The convention went on record as opposing the drastic cuts in the budget of the U.S. Office of Education and urged the Congress and the President to restore the appropriations to the same level as for the current fiscal year. Action was also taken urging the appointment of a U.S. Commissioner of Education with background and experience in the public-school field.

A feature of the convention was the method of presenting issues at general sessions and then breaking up into smaller discussion groups to give those in attendance an opportunity to participate.

A large number of students from various teacher-training institutions were in attendance and carried on several sessions on their own.

Trips were taken by various groups to a number of industrial and cultural points of interest about the Detroit area.

Announcement was made that the convention would be held in Los Angeles, California, in 1954 from March 23 to 27 with headquarters at the Statler Hotel. ★

School Shop KINKS

Payment will be made for each Kink published. Send to Editor, School Shop, Ann Arbor, Mich.

For That Black Finish

Here is a way to obtain the black finish for furniture now in the modern trend.

Since a commercial wood stain or dye in black is almost impossible to find, use leather dye. Black enamel or flat black paint diluted with an equal amount of paint thinner will do almost as well. Wipe the solution on all surfaces, allow to stand for 10 minutes, then wipe off thoroughly. Let dry overnight. Then wipe on a dark brown stain, let dry for a few minutes, and wipe off. The small amount of brown that will be left gives a warm, rich glow that would be lacking with black stain alone, but the appearance will still be black.

A very attractive finish emphasizing the natural grain of the wood may be obtained by omitting to fill the wood before applying the stains. When the stain is dry, apply a coat of thick white paint, or perhaps ivory. Wipe off almost immediately across the grain, leaving the grain filled with the lighter color. This will work well only on the open-grained woods such as oak and walnut.—*L. Don Potts, Knoxville, Tenn., Evening School.*

Teaching Ruler Divisions

As a mechanical drawing teacher in junior-high-school, I find that many students coming in from the sixth grade do not know how to read the divisions on a ruler. This handicaps them, of course, in reading the scale they are to use in mechanical drawing.

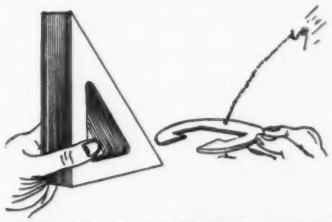
To overcome this deficiency and to speed up the process of learning, I made an oversized scale that can be read from anywhere in the room. I found that making just three or four inches of the scale serves very well. I made the 1/16" division 1½" long. This makes the ⅛" division 3" long, and so on.

I made the scale out of a piece of 1"x6" white pine, painted the numbers and divisions on with black paint and then gave the scale a coat of clear varnish to prevent it from becoming soiled.

I also made a moveable point which slips over the top edge. This can be used for pointing out divisions asked for by the students or for use when giving tests on reading the scale.—*Carl D. Welch, South Junior High School, Joplin, Mo.*

Counting Triangles

We have found an easy way to speed up the process of counting the plastic triangles when they are collected at the toolroom of our school shop after every class.

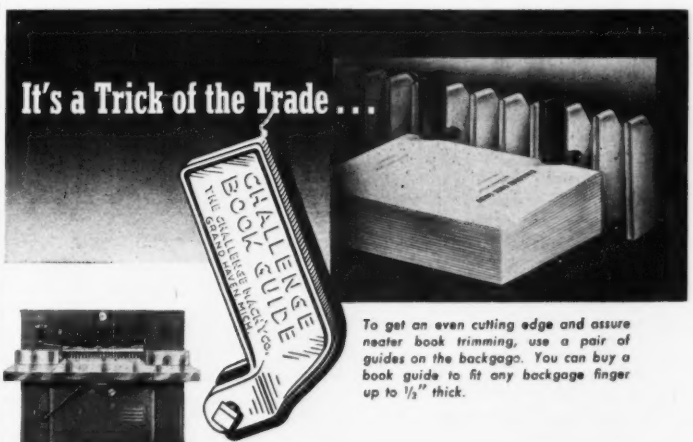


From a broken triangle we cut a gage which measures the thickness of 12 triangles. By checking with our plastic gage, we now can count the triangles 12 at a time. In other words with only four checks we can tell when all 48 triangles have been returned.

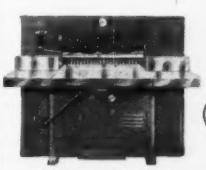
The gage is hung from the toolroom wall by a cord for convenient use.—*Roger M. Woodbury, Wellesley Public Schools, Wellesley Hills, Mass.*

Student Loan Fund

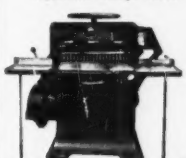
A loan fund for vocational students has been established at the New Rochelle High School, New York, under the



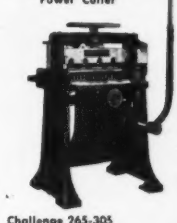
To get an even cutting edge and assure neater book trimming, use a pair of guides on the backgage. You can buy a book guide to fit any backgage finger up to ⅓" thick.



Challenge 370 Automatic (Hydraulic Clamp) Cutter



Diamond (Hand Clamp) Power Cutter



Challenge 265-305 Lever Cutter

Challenge 265-305 (Hydraulic Clamp) Power Cutter

BUT IT'S NO TRICK TO DO AN ACCURATE JOB WITH A DEPENDABLE

Challenge Cutter

Regardless of your shop size, there is a Challenge cutter for you. There are 11 styles and 7 sizes to choose from, ranging from lever cutters in bench and floor models — to power cutters with hand or hydraulic clamp. Each of these cutters has been perfected by Challenge engineers to give the operator *maximum* protection . . . more working freedom . . . and precise control of cutting operation. A Challenge cutter is a long term investment that pays off in less maintenance . . . greater safety . . . more accurate cutting. 703R

Challenge Pony Lever Cutter

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GRAND HAVEN, MICHIGAN
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DEALERS IN ALL PRINCIPAL CITIES

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TRADE-MARK Ⓡ

direction of Edward J. Fitzgerald, a coordinator in the school.

By means of the fund boys and girls who need financial help are able to borrow money to enable them to purchase materials, tools, equipment, and personal uniforms mainly for their shopwork. All loans are approved by a board of directors and are repayable at a time agreed on. They bear interest only in event of default.

The fund was started with money contributed by the Parent Teacher Association. It was increased by private donations and by vocational students who made and sold articles.

The revolving feature of the fund permits continuous loans to be made to meet the needs of the pupils.—*Viewpoint, January, 1953*

Marking Drills

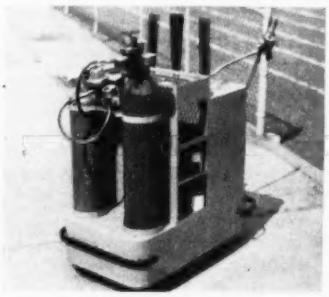
Drill sizing is a time-consuming and tedious problem particularly when letter, number, and fractional drills are mixed up by the students or when the original nomenclature has been chewed off the shank.

When a new drill is placed in the rack it should have the size etched on the drill where the body and shank come together or on the body near the shank. It is comparatively safe from destruction at these points. The size can be etched on with acid, but a better method is with an electric etcher. Another method of marking is with a flexible shaft or small hand grinder and a mounted point.

Some new drills are blued. In this case a spot ground by the pedestal grinder will provide an excellent place to mark the drill.—*Walter E. Bandlow, Shaw High School, East Cleveland, Ohio.*

A Complete Welding Cart

In order to be sure that everything needed to do the welding job is always at hand, we have designed and use a four-wheel oxyacetylene welding cart.



This cart is built up from 18-gage black steel on a frame of small angle iron. The back wheels are 10" in diameter with semisolid heavy rubber tires to support the weight of the tanks. The front wheels are of the same diameter with lighter tires.

The cart is pulled and steered by the arm at front, which is connected directly to the two front wheels by a shaft extending through the cart.

The front part has four openings with tubing connected to them for storage of welding rods. One of these has a plunger, so that short pieces can be placed in the tube and pulled to the top when needed. Also in this front section is a larger tube to hold a fire extinguisher.

The center section is composed of shelves for the storage of tongs, flux, extra torch, etc. On the top is a rectangular basket for the hose.—*E. C. Clouse, Parkersburg, W. Va., High School.*

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CHICAGO U. S. A.

Important ★
above all else in school lathes

★SHELDON SAFETY
. . . all belts, pulleys, countershafts, gears and motors are completely enclosed. Speed changes and gear-ratio changes are made by external shift levers.

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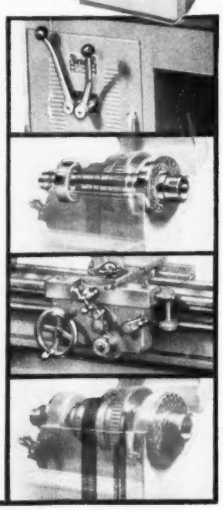
. . . Timken "Zero-Precision" Tapered Roller Spindle Bearings (the absolute in accuracy) permit student work to ten-thousandths of an inch, and hold this accuracy without constant maintenance.

★SHELDON CONTROLS
SHELDON-taught students are ready to operate standard industrial lathes—are familiar with standard controls and the "big lathe feel".

★SHELDON CAPACITY
The extra swing and greater collet capacity increase the range of possible student projects—from the "playing store" group to the practical. The extra power to the spindle, the speed range, weight and strength of SHELDON Precision Lathes permit heavy cuts, spinning and demonstration of correct use of new cast-alloy and carbide-tipped cutters.



Built by modern methods, with the finest machine-tool special machinery, on a continuous production line basis, these better lathes cost little more than ordinary school type lathes. *Write for Catalog*

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Model Engines . . *from page 12*

X-acto Crescent Products Co., Inc., 440 Fourth Ave., New York 16, N.Y.

Scientific Model Airplane Co., 115 Monroe St., Newark 5, N.J.

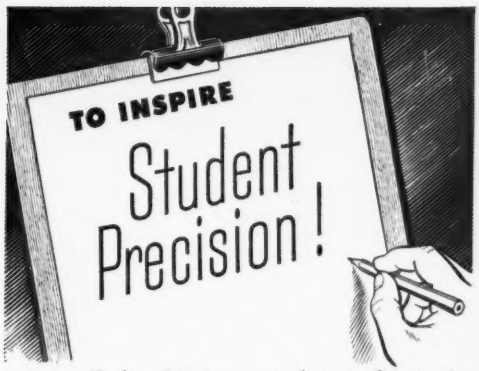
Kenhi Model Products, Burbank, Calif.

De Bolt Model Engineering Co., Williamsville, N.Y.

Sterling Models, 1530 N. Hancock St., Philadelphia 22, Pa.

Hobby Enterprises, Bay Shore, N.Y.

Berkeley Model Supplies, West Hempstead, N.Y. ★



Preferred by instructors because they inspire students to new achievements . . . WESTON instruments also are the choice of practical administrators because their ruggedness and year after year dependability make their cost remarkably low! Ask for bulletin listing all instruments.

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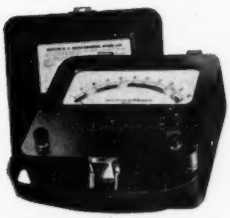
For Advanced Requirements MODEL 622



Ultra sensitive instruments of the double pivoted type requiring no leveling when used in horizontal position. Combine high accuracy and a 6.1 inch scale . . . ideal for precise measurements of potential and current at very low energy levels. Available as d-c voltmeters, millivoltmeters, milliammeters and microammeters; electrolysis volt-millivoltmeters and high resistance voltmeters—also as a-c rectifier type instruments and as thermocouple ammeters, milliammeters and voltmeters.

For Electrical Machinery Labs MODEL 633

A clamp-on volt-ammeter built to Weston standards of safety, accuracy and dependability. Five full scale a-c current ranges of 1000/250/100/25/10 amperes with range overlap. Three self-contained a-c voltage ranges of 700/350/175 volts—insulated for 750 volts. Has convenient 6 position switch easily operated by thumb—adjustable pointer stop facilitates measuring starting current of motors.

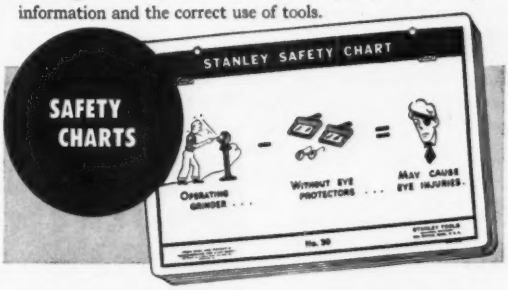
WESTON

WESTON *Instruments*

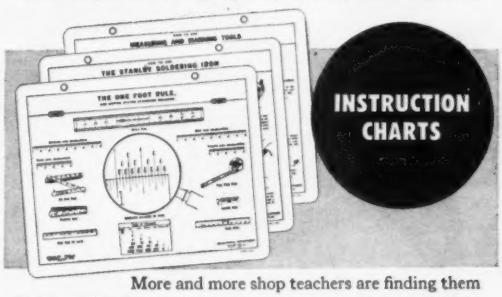
STANLEY *School-Tested* CHARTS

help shop instructors . . .

Stanley Safety Charts and Instruction Charts are effective teaching aids that save time in covering important safety information and the correct use of tools.



Excellent for safety discussions in the shop. Simple, colorful and humorous, they put across a telling message that is easily remembered. Size: 18" x 12", lacquered to prevent soiling, equipped with metal grommets for hanging on hooks. 36 charts per set. $2.50 postpaid in U.S.A. (In Canada, $4.10)



More and more shop teachers are finding them indispensable for teaching the proper use and care of tools. Hundreds of line drawings make them easy to understand and remember. 38 different charts printed on both sides of heavy cardboard comprise the set of 19 cards. Size is 27½" x 20½". Cards are lacquered both sides and fitted with two metal grommets for hanging on hooks. $5.50 complete set postpaid in U.S.A. ($7.25 in Canada).

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USE THIS COUPON

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☐ Send me one set of Stanley Safety Charts, $2.50

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(Enclosed is proper amount.)

Name.....

Subject you teach.....

School.....

City.....Zone No.....State.....

Challenge . . . . . *from page 8*

About Emphasis

Now a few words with regard to this matter of emphasis. Since we have arbitrarily decreed that industrial arts is basically for the *general* development of our youth, the primary emphasis in *industrial arts* shall be on the *general* values attached to *all* of the content derived from *industry*. However, because EDUCATION as it is conceived here has guidance service as one of its functions the industrial-arts educator must point out the *special* values to his students, though the emphasis here is only secondary. To get the significance of this reflect if you will on the question: Can you honestly tell a student that the skills and the knowledges he develops or acquires in an industrial-arts course in drawing, woodwork, or metal work, etc., cannot, must not, or should not be used in a work situation? Obviously many boys have applied and many will apply such learnings in work situations.

Turning your attention now to the vocational-industrial, it is obvious that the primary emphasis is to be placed on the special values—those values which will enable the individual to produce and to earn a living thus completing the necessary requirements of worthy social membership. It should be noted here that the *special* development function of EDUCATION can be completed within one of the areas; but that same area cannot serve alone to complete the *general* development of the individual. The *industrial* area of EDUCATION, in this instance, can contribute only partially to the *general* development of the individual for this is simply a *secondary* emphasis. The significance of this may be readily inferred from the following question. Can you deny an individual who is pursuing a course or courses in automobile mechanics the consumer values of the skills and knowledges he acquires? Obviously, we cannot say to him, "Don't use what you learn here if you go out to buy a car because this has *special* (vocational) values only."

A Challenge

It may safely be concluded that if we truly represent the content derived from *industry* we as industrial educators must acknowledge both its *general* and *special* values, albeit the industrial-arts educator will stress its *general* values and the vocational-industrial educator will stress its *special* values, and *both* will assist the youth in the choices he must make, thus providing him with an EDUCATION insofar as industry is concerned.

Admittedly there are other facets to the natural unitary educational nature of the area based on industry, e.g., correlation or integration with other educational areas and completeness in EDUCATION. EDUCATION is a total process, a single process, a process which must be as complete as we can make it. But, completeness is relative—it will vary with individuals. However, to express it briefly, every youth is entitled to as much as he can profit by, within the limits that society can provide, and it (EDUCATION) should function so as to provide him with *general* and *special* development tempered with good *guidance*. Admittedly methods, content, and organization along with other aspects are worthy of deliberation. However, space limitations do not permit, so I should like to conclude with a challenge in the form of the resolution presented below:

I resolve as an educator (industrial) to do my utmost to develop the whole of the individual in skill, knowledge, and attitudes; laying emphasis on both development for living and development for earning a living according to the purpose of my work, whether it be primarily general and secondarily special or vice versa; and that I shall be ever conscious of fulfilling his need for guidance in making wise life choices and decisions. ★

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HACKSAWS AND BAND SAWS

All the skill and precision you associate with Starrett Tools go into Starrett Hacksaws and Band Saws. Precision made by latest manufacturing techniques in a modern, streamlined plant. The result is blades and bands that cut better, last longer, give you more for your money. It pays to specify STARRETT.

FREE REFERENCE MATERIAL

Starrett Hacksaw and Band Saw Catalog and the Starrett Cutting Chart give complete information on cutting any material. Free to instructors. Send for it. Address Dept. SS.

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Buy THROUGH YOUR INDUSTRIAL DISTRIBUTOR
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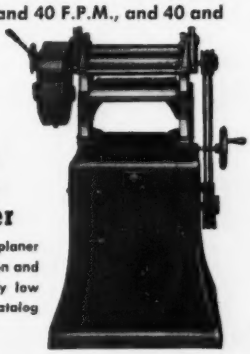
PARKS No. 20 20" PLANER

Here is a modernly designed, rugged, high-speed, low-priced planer that is ideally suited for every shop and industrial plant requiring a quality surfacer. The Parks No. 20 Planer has a four-knife cutterhead with a speed of 3600 R.P.M. and offers two feed speeds—20 and 40 F.P.M., and 40 and 80 F.P.M. Write for complete descriptive literature.



The PARKS Heavy-Duty 12" x 4" Planer

A compact, sturdy, thickness planer that offers mill planer precision and ruggedness at a sensationally low price. Write for descriptive catalog sheet.

The PARKS WOODWORKING MACHINE CO., Dpt.24-A26, 1546 Knowlton St., Cincinnati 23, O.

New SHOPMASTER
PRESENTS THE SENSATIONAL
Universal
INDIVIDUAL COMBINATION
Power Tool

As Ball Bearing Radial Arm Saw
Mitres, compound mitres, cross-cuts, dados, rips, cups, grooves. With 8" blade... 2-9/16" cut.

As a Ball Bearing Radial Arm Drill Press
3" stroke... 18" throat. Drill, rout or mortise at any angle, within any radius, in 36" circle.

As a Ball Bearing Radial Arm Sander
Either belt or disc sander locks in vertical or horizontal position, or at any angle.

It's a
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All in one

A complete school workshop—all in one.

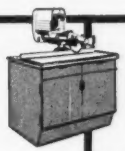
It's easy to convert—simple to operate—yet precision-built to finest professional quality. Quick, easy changes make possible diversified training on a single tool.

All moving parts glide smoothly, effortlessly on friction-free ball bearings. Easy-to-read calibrations permit quick precise settings. Tools lock in any position.

Complete unit includes "Heavy bench with tool compartments, 8" radial arm saw, 21" radial arm drill press with keyed safety type chuck sanders, V-belts and pulley".

$249.95 LESS MOTOR

See other famous SHOPMASTER tools



SHOPMASTER, INC., Dept. SS6, 1214 Third Street South, Minneapolis, Minnesota
Send information on new Shopmaster Universal Power Tool TODAY!

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News

HAPPENINGS IN INDUSTRIAL EDUCATION

Illinois Association Officers

NEW officers of the Illinois Industrial Education Association elected at the recent meeting in Peoria are: president, Orlin Trapp, Waukegan; vice-president for T&I, Rubin Wright, Alton; vice-president for industrial arts, William C. Bicknell, Carbondale; and treasurer, James M. Crowe, Chicago.

Canadians Affiliate with AIAA

THE Ontario Association of Industrial Arts has affiliated with the American Industrial Arts Association, according to R. Archie Baker, secretary. The charter was presented at the annual convention of the Ontario group in Toronto April 7. Mr. Baker reports that Ontario has over 500 school shops distributed throughout the province and shops are being added at the rate of 30 or 40 a year over the past several years.

MIES Holds Meeting

THE Michigan Industrial Education Society held its 25th and silver anniversary convention at Grand Rapids April 16-18. New officers are president, Walter Scharmack, East Grand Rapids; vice-president, Morley Dixon, Bay City. Edwin Rowley of Berkley was reelected executive secretary-treasurer.

The group cast an overwhelming vote in favor of a liability insurance plan for the protection of shop teachers. Details are being worked out by the executive committee and will be presented to the full membership for a final decision.

Warren L. Small of the Aero High School, Detroit, was named master teacher of the year and Lee Thurston, state superintendent of public instruction, was presented an honorary life membership.

New School in Mobile

A NEW state trade school is now under construction in Mobile, Ala., on a 28-acre site donated by the city of Mobile for the purpose. Clay Knight is director of the school which will offer a full line of courses in the trade and commercial fields.

NC Group Meets

THE North Carolina Industrial Arts Association met in Raleigh on April 11 with a project fair as the highlight of the sessions. Prizes were awarded for the best projects in various shop areas. New officers are Frank Briley, Raleigh, president; T. J. Haigwood, Charlotte, vice-president; Marshall Schmitt, Raleigh, secretary-treasurer; and Henry Burton, Winston-Salem, member of executive committee.

Shop Planning Workshop

A WORKSHOP on shop planning will be offered at Iowa State College from June 15 to 27. The workshop is open to experienced teachers who have planning problems, either for a new building or for the remodeling of an existing shop or building.

Convention Calendar

Georgia Vocational Association, Municipal Auditorium, Macon, June 11-12.
International Graphic Arts Education Association, Statler Hotel, New York City, June 14-17.
Colorado Vocational Association, Colorado A & M College, Fort Collins, June 15-19.
Pennsylvania Vocational Association, Eagles Mere, June 17-19.
Minnesota Vocational Association, Radisson Hotel, Minneapolis, Oct. 2-3.
Four-State Conference, Kansas State Teachers College, Pittsburg, Oct. 2-3.
American Vocational Association, Conrad Hilton Hotel, Chicago, Ill., Nov. 23-27.

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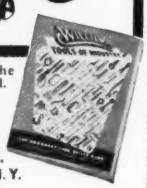
Put SKILL in the Palm of your hand!

The feel, fit and finish of Williams tools tell you there are none finer. Functional design, extra durable strength and correct balance help you do a better job...easier and faster. Designed and made by specialists, they have been "tested" and preferred by leading industrial and automotive mechanics for over 70 years.

In the 1953 line—you will find a large number of new, improved and streamlined products which offer outstanding advantages through more efficient and skillful application on a variety of jobs. You'll want to know more about these tools. And you can — by writing for our new catalog.

Be Wise... Buy WILLIAMS INDUSTRIAL TOOLS

Catalog 301 shows the broadest line of its kind. To obtain your copy, simply write stating your position and school.



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579 Vulcan Street, Buffalo 13, N.Y.

Tannewitz MODEL "XJ" MITRE SAW

SAFE—ACCURATE—CONVENIENT!

CHOICE OF 5 TABLES

MODEL XJ

The newest and finest development in mitre saw benches is the Tannewitz "XJ" which allows you to select just the type of table you prefer. It's safe as can be, carefully guarded; equipped with pneumatic dust discharge and micrometer fence. Uniquely adaptable to sawing plywood — the perfect mitre saw bench for shop training. Let us help you select the Mitre Saw Bench or Band Saw best suited to your requirements.

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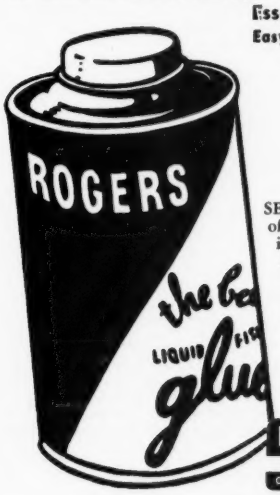

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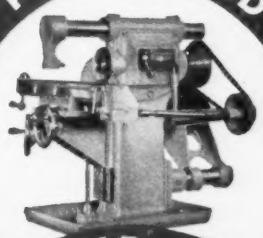

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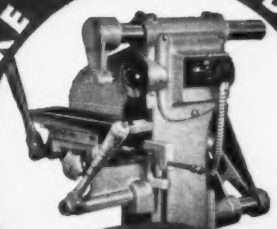

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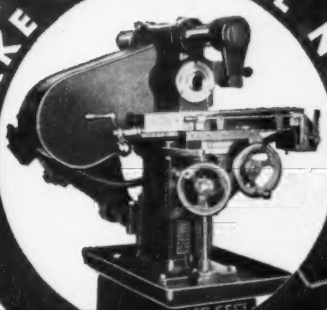

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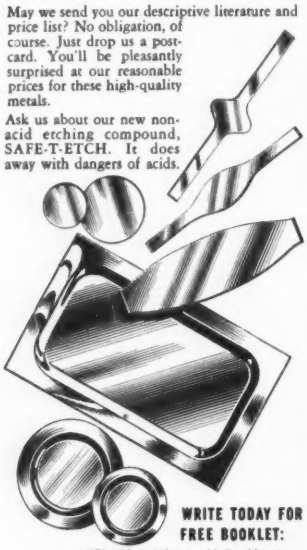

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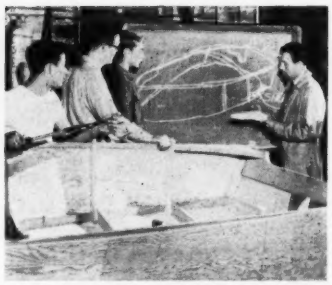
Your Shop Can Build Kit Boats

By Glen Potter

Algonac, Michigan, High School



The functions of a transom knee in a 14' runabout are being explained here by the author (right) to members of his boatbuilding class.

OWNING a boat—any kind of a boat—is almost a basic human desire in men and boys. Here in Algonac, Michigan, this desire is even more pronounced because Algonac itself is not only practically surrounded by water but the world's largest manufacturer of boats, Chris-Craft Corporation, is located here.

In Algonac High School it is natural that the interest in boats should be emphasized in our industrial-education classes. Boat building has been a part of the curriculum for many years. Today our students are turning out top quality boats and saving money doing it.

We feel that the kit boat offers many advantages to a school shop. True, the students do not receive the experience of laying-out and cutting the various parts of the boat since all parts come ready-cut in the kit. The kit boat, however, does give the students other compensating experiences.

The students learn the parts of a boat and the terminology of the boat builder. They learn how to assemble a boat. Since they can do it on an assembly-line basis similar to that employed in the manufacture of factory-built craft, they receive practical experience in production-line problems. They learn the value of co-operation in project work. They learn how to follow written directions. They also learn how to finish a boat and the necessity for giving it a good finish to insure long life for the craft.

A view of the production-line methods used in assembling boats in the Algonac high-school shop. The hulls are hoisted to the ceiling when the class is not in session.

Because the kit boat can be assembled in a fraction of the time needed for laying-out and building a regular boat, the class can build enough boats for each member of the class to have one by the end of the school term. This also serves to keep interest at a high level. Then, too, the cost of the kit boat is small compared to the cost of a stock model boat, and that means that the financial burden will be less.

Our boatbuilding course is open only to sophomores, juniors, and seniors who have completed woodworking and machine woodworking courses. This tends to keep the class within practical bounds. The class is conducted for just one hour a day. During the rest of the day the partially-finished hulls are hoisted to the ceiling so they will not interfere with the other classes.

The boats we have been building are a 10' utility racing pram and a 14' runabout. Boat kits, however, come in a variety of sizes and models, ranging from 8' prams to full-size cruisers, both inboard and outboard models. Most kit boats are made of plywood. The boats we build have Philippine mahogany structural parts and fir marine ply panels.

This boatbuilding project has had a worthwhile out-of-school result. The shop students have developed a keen interest in boating, an interest which was a prime mover in the establishment of a weekly summertime racing schedule on nearby St. Clair River by the local boating club. One 13-year-old student, Jim Pocklington, has won more than 10 trophies with his school-built boat. ★

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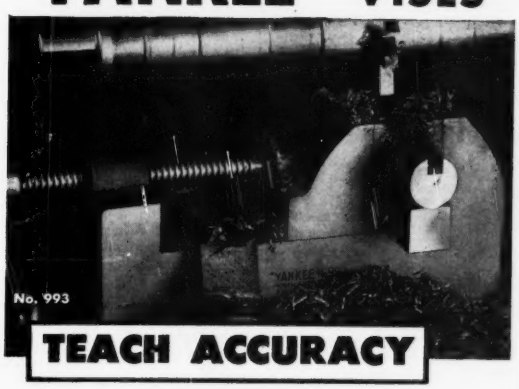

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Instructional RESOURCES

BOOKS:

Simplified Drafting Practice. Healy and Rau. New York: John Wiley & Sons, 1953. Pp. vii+156. $4.00.

In this book the authors present a point of view in regard to mechanical drafting which may disturb some of our more formal teachers of drafting. However, both authors have had wide experience in industry and are therefore in a position to interpret its needs insofar as working drawings are concerned. They point out that many lines may be omitted from a drawing without destroying its clarity. They have found from experience that large savings of time and paper can be achieved by the adoption of the system suggested. This saving would seem to be a vital factor which should receive consideration in any program for training draftsmen.

Every teacher of drafting should have a copy of this book even though he has not reached the stage where he is willing to adopt all of the suggestions made.

William L. Healy and Arthur H. Rau occupy important positions in the drafting department of the General Electric Co.

Synchros Self-Synchronous Devices and Electrical Servo-Mechanisms. Crow. Vincennes, Ind.: Scientific Book Publishing Co., 1953. Pp. x+222. $4.20.

This book contains a comprehensive discussion of the principles involved in selfsynchronous electrical mechanisms. The structural features of these mechanisms are described, as well as their application to the various situations in industry where they are used.

The contents are quite technical. However they should be most helpful to students in technical schools and universities. The book is well illustrated, and it contains a wealth of information which should be of interest to those who are concerned with the many new applications of selfsynchronous devices.

Leonard R. Crow is educational specialist with the Universal Scientific Company.

Industrial Labor and Community Relations. Albany, N.Y.: Delmar Publishers, Inc., 1952. Pp. vii+174. $2.75 (paper), $3.75 cloth.

This book deals with a subject which is vital to every individual who is a member of industrial society. The material presented is designed to provide the student with a picture of the many associations that affect the functioning of an industrial or social group. This material has been organized into a series of instructional units, each unit being important in the relations of people who must work together for the common good. The whole book lends itself to being used by discussional groups, and should be especially valuable for apprentice training or for basic material in trade or technical classes.

This is a publication of the New York Vocational and Practical Arts Association, and was prepared by a group of leaders in the field of vocational education in this state.

Fundamental Jobs in Electricity. Perry and Schafebook (2nd Edition). New York: McGraw-Hill Book Co., Inc., 1952. Pp. xii+306. $3.60.

This book contains information concerning and directions for making 132 different jobs suitable for assignments in a high-school course in electricity. There are many excellent illustrations which serve to clarify the detailed instructions given. Then too the teacher will welcome the lists of thought-provoking questions that accompany each job.

Edgar C. Perry was formerly an instructor in applied electricity. He is now superintendent of schools in Indiana, Pa.

Harry V. Scahfebook is an instructor in electricity, John B. Stetson Junior High School, Philadelphia, Pa.

Pottery: Getting Started in Ceramics. Olson. Scranton, Pa.: International Textbook Co., 1953. Pp. x+113. $3.75.

This book is designed for beginners in one of the oldest crafts. For this reason the many step-by-step illustrations make it especially suitable for use in the school shop. The chapters include discussions on types and composition of potter's clay, on the problems of design in clay, and on methods used in forming clay. In addition some space is devoted to glazing and firing of clay.

The book should be popular as a textbook in industrial-arts departments where clay is used as one of the mediums of expression.

Delmar W. Olson is Professor of Industrial Arts at Kent State University, Kent, Ohio.

28 Table Lamp Projects. Menke. Bloomington, Ill.: McKnight & McKnight Publishing Co., 1953. Pp. viii+77. $2.50.

This book contains a wide range of designs for table lamps, both modern and traditional. Many of the projects involve woodturning, but others provide opportunities for the use of hand tools. It will be a welcome addition to the reference library in a school wood shop where the pupils are interested in attractive take-home projects.

H. A. Menke is an industrial-arts instructor in the Analay High School, Sebastopol, California.

Basic Sheet Metal Practice. Giachino. Scranton, Pa.: International Textbook Co. 1952. Pp. ix+245. $4.00.

This book is intended to be used as a text, and is designed to provide information on the basic operations used in the sheet-metal industry. It is suitable for industrial-arts classes as well as for beginners in T & I classes. The projects presented in the last section incorporate most of the processes described in the earlier pages, and have been selected on the basis of pupil interest and utility. The questions at the end of each chapter tend to increase the value of the book to a teacher who is interested in providing related knowledge as well as in developing manipulative skill.

J. W. Giachino is head of the Vocational-Industrial and Technical Education Department at Western Michigan College of Education, Kalamazoo.

Pamphlets:

Industrial Arts Laboratory is a 150-page course of study published by the Chicago Public Schools and authored by a committee of teachers. It covers seven industrial-arts areas (electricity, metal, wood, plastics, graphic arts, ceramics, and leather) at the junior-high level. Topics covered include objectives, suggested jobs, field trips, audio-visual materials, minimum equipment, and things the student should learn. Contains much helpful material. Available from the Bureau of Curriculum, Board of Education, 228 North LaSalle St., Chicago 1, Ill., at $1.25.

Administration of Vocational Education at State and Local Levels (for superintendents and boards of education) is a pamphlet prepared by the Committee on Research and Publications of the American Vocational Association which tells schoolmen why they should become more concerned with vocational education and how they can translate that concern into action. The role of vocational education in the local schools is covered as well as suggestions for the organization and promotion of the program at local and state levels. Available without charge from the AVA, 1010 Vermont Ave., N.W., Washington 5, D. C.

How to Operate a Profitable Electrical Service Department is a manual in five sections covering how to set up an automotive electrical servicing department, how to locate trouble, testing of regulators and generators, adjusting and repairing them, and specifications for them. Available from the Allen Electrical and Equipment Co., Kalamazoo, Michigan.

Audio-Visuals:

Woodworking is a new full-color, six-title filmstrip series covering the following topics: "Design in Wood," "Hardwood Lumbering," "Hardwood Processing," "Finishing—1," "Finishing—2," and "Safety in the Shop." This series was developed cooperatively by McKnight and McKnight Publishing Co., Bloomington, Ill., and the Audio-Visual Division, Popular Science Publishing Co., 353 Fourth Ave., New York, N. Y. Available from the above companies or local dealers at $31.50.

Your Future in the Metal Trades is a set of seven filmstrips covering occupational opportunities in machine shop, auto mechanics, foundry and forging, welding, airplane mechanics, railroad shops, and other metalworking areas. Discussion topics are included in each strip as well as pertinent information about the field. Available at $3.25 each or $21.00 for the series from Charles A. Bennett Co., Peoria 3, Ill., or Society for Visual Education Inc., 1345 Diversey Parkway, Chicago 14, Ill.

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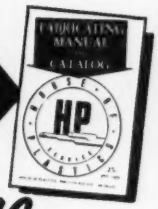

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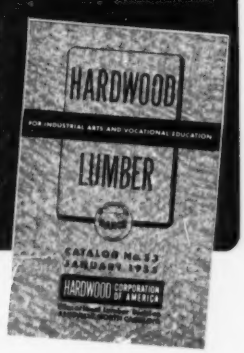

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News from INDUSTRY

New 4.5 MC Crystal Presented By EICO

Electronic Instrument Co., Inc., has recently released Model C4.5, 4.5 megacycle crystal, designed to facilitate the alignment and servicing of television sets with the new IF frequencies. Model C4.5 may be used with most FM and TV oscillators, accommodates standard sockets and circuits, and gives outstanding performance with the EICO Model 360 TV-FM Sweep Generator.

For further information write the Electronic Instrument Company, Inc., 84 Withers St., Brooklyn 11, N.Y., mentioning SCHOOL SHOP; or *check no. 73 on the coupon.*

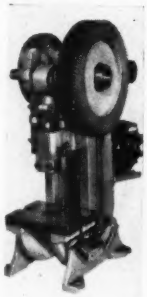
Vulcan Hot Plate Gives Temperatures up to 600°

Stepless adjustment thermostatic heat control from 150° to 600° is one of the outstanding features of the new Vulcan laboratory-type hot plate. Any required uniform surface temperature can be maintained by a simple dial setting on the front of the unit. The dial is graduated from 0 to 100. The entire device is of steel construction, is 3½" high, and has a crackle finish. The top plate, 6" in diameter, is provided with heat escape vents under its rim. It will be found useful for such things as heating glue pots and numerous other shop uses.

The replaceable heating element is jacketed with stainless steel. Current consumption is 500 watts at 115 volts. It is also available in 230 volts. A 6' UL-approved asbestos-covered cord is standard equipment. The plate is also available with a three-step temperature control, through a cord switch, if desired.

For further information write Vulcan Electric Company, Danvers, Mass., mentioning SCHOOL SHOP; or *check no. 74 on the coupon.*

New Series of Back-Geared Benchmaster Punch Presses



Especially designed for drawing, forming, and other metal operations requiring slow, powerful strokes, a new series of punch presses is being offered by Benchmaster. They are equipped with stub-tooth back gears, reducing speed range from 40 to 100 strokes per minute. Speed may be varied by changing size of motor drive-pulley.

Benchmaster's positive, single-trip mechanism is employed which requires the ram to be individually triggered for each stroke. It can be converted, however, to continuous motion by the removal of one screw. These presses may be either hand- or automatically-fed.

Back-gearing is available on three models—4-ton standard, 4-ton deep throat, and 7½-ton. General specifications are identical with respective plain types. Overall frame sizes also remain the same.

For full details write Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif., mentioning SCHOOL SHOP; or *check no. 75 on the coupon.*

Plumb Rehandling Kits

Anyone can now replace an ordinary hammer handle with one made of shock-absorbing second-growth hickory and tested to withstand 23,000 pounds maximum fibre stress at the weakest point.

A complete line of rehandling kits—with handles for every size of hammer and hatchet—is being put on the market by Fayette R. Plumb, Inc., of Philadelphia 37, Pa. Each kit contains a completely finished hickory handle, stained and varnished; two wedges, one cement-treated hardwood and the other a metal cross wedge; and an illustrated set of instructions showing how the tool can be rehandled in five minutes. See your local hardware dealer. If unavailable, write Plumb for further information mentioning SCHOOL SHOP; *or check no. 76 on the coupon.*

Ceramic Workshop for Teachers

American Art Clay Co. will continue the series of summer workshops for teachers and occupational therapists this year in Indianapolis. All workshops will be held in the John Herron Art School. For the two-week ceramic workshops the John Herron Art School offers two semester hours of undergraduate or graduate credit dependent upon the qualifications and needs of the student.

For complete information, write the American Art Clay Co., 4717 W. 16th St., Indianapolis 24, Ind., mentioning SCHOOL SHOP; *or check no. 77 on the coupon.*

New Literature:

The 1953 Catalog of Charvoz-Roos Corp. contains 60 well-illustrated pages of drawing instruments, drafting materials, paper, and scientific instruments with full descriptions, prices, and instructions for ordering. Write Charvoz-Roos Corp., Box 92, East Rutherford, N. J., mentioning SCHOOL SHOP; or *check no. 78 on the coupon.*

Utica Drop Forge & Tool Corporation is offering free a new tool catalog No. 66-1952 replacing Utica catalog No. 63-D and featuring diagraming of the tool jaws with accurate dimensions. This illustrated 24-page catalog contains a list of decimal equivalents and pertinent data on Utica tools—82 models of pliers and the complete line of adjustable wrenches. Requests for the free catalog should be sent to H. J. Zellweger, Utica Drop Forge & Tool Corporation, Utica 4, N.Y., mentioning SCHOOL SHOP; or *check no. 79 on the coupon.*

Helpful Hints is the title of a colorful, pocket-sized brochure put out by the X-acto Crescent Products Company for the convenience of X-acto users. Copies of the illustrated folder may be obtained by writing X-acto Crescent Products Co., Inc., 440 Fourth Ave., New York 16, N. Y., mentioning SCHOOL SHOP; or by *checking no. 80 on the coupon.*

Wells Horizontal Band Saws is the title of a new 12-page catalog issued by the Wells Mfg. Corp. describing its complete line of horizontal metal-cutting band-saw machines. A feature of the catalog is a handy reference chart for proper selection of blade, feed, and speed for cutting various types and sizes of materials. Copies may be obtained free of charge from Wells Mfg. Corp., Three Rivers, Mich. Please mention SCHOOL SHOP in writing; or *check no. 81 on the coupon.*

SAFE-T-ETCH is a new nonacid aluminum etching compound, which removes all of the objectionable features that are involved in using acid. SAFE-T-ETCH is a harmless powder. Only a few tablespoons of the compound are added to hot water.

Complete details on its use are covered in a step-by-step procedure in a new bulletin recently issued by Metal Goods Corp., 640 Rosedale Ave., St. Louis, Mo. For a free copy, write the company, mentioning SCHOOL SHOP; *or check no. 82 on the coupon.*

Craft Reporter: As a service to craftsmen individually and to groups using crafts in their program, Craft Service, Rochester, N. Y., has resumed publication of the *Craft Reporter*, which contains the latest developments in the craft field. The *Craft Reporter* is issued three times yearly. To be placed on the regular mailing list free of charge, write Craft Service, 337 University Ave., Rochester 7, N. Y., mentioning SCHOOL SHOP; *or check no. 83 on the coupon.*

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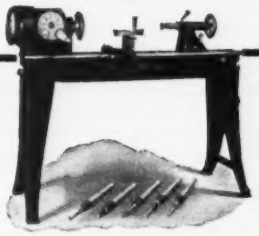

Students soon learn to spin articles of surprising beauty from copper, bronze, aluminum, etc. This "Oliver" Lathe has a heavy bed, extra large bearings and live tail center. Has ball bearing motor-driven headstock adjustable from 800 to 2750 r.p.m. Swings 12" diameter, 24" between centers. For turning wood, this Lathe is unmatched. Write for Bulletin No. 159-M.

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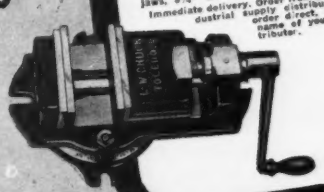

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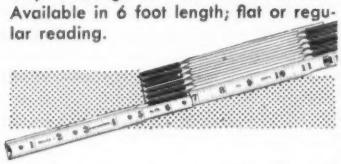

2. THE X-6 EXTENSION RULE. This is a variation of the folding rule, but with a special 6" brass extension that is especially useful and handy for exact accurate inside measurements. It eliminates guess work on short extra measurements. Simply expand rule to closest measure possible and slide out insert with free hand. The simplified two-piece joint of the X—6 designed to withstand pull, push and slide strain. A spring catch keeps the slide rigid in the extended position. 6 foot length only.

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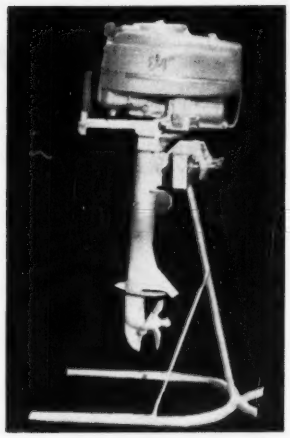
MASTER
MASTER RULE MFG. CO. INC. Middletown New York
WOOD AND STEEL TAPE RULES

For a useful welding project, try this

Outboard Motor Stand

By Jack N. DeKeuster

Vocational School, Racine, Wisconsin



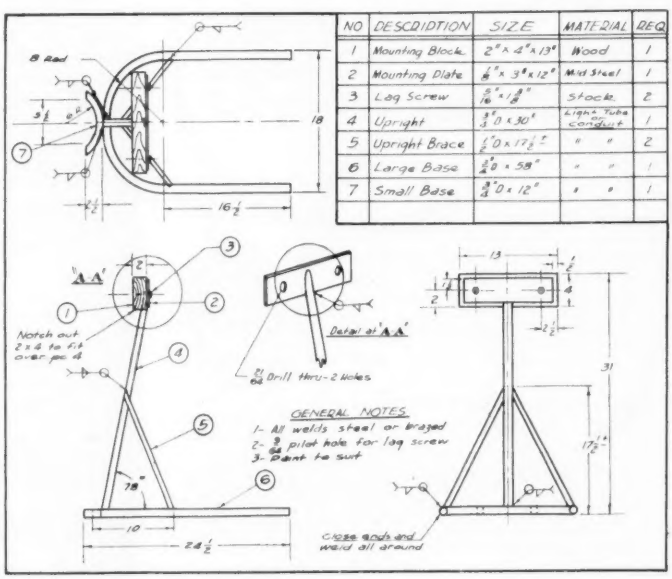
THIS outboard motor stand fulfills essential learning units in welding, layout, and forming. It goes without saying that it is also a useful article, one that will be appreciated by the student's parents—and maybe the student himself.

This stand was made by Ronald Tepley, an advanced student in the welding department of the Vocational and Adult Education School, Racine, Wisconsin. The drawing of the stand, below, was made by Charles Bullette, a student in the drafting department.

In making the stand, all the pieces are first laid out to lengths. Then the large base, No. 6, is formed to shape using a metal form 16" outside diameter. The safety base, No. 7, is also formed by heating and shaping over a forming jig with 12" outside diameter. These two base sections prevent the stand from falling in any direction.

All pieces are next assembled by tacking. The stand is then ready for complete brazing or welding. The final step is the bolting of the mounting block, No. 1, to mounting plate, No. 2, with two 5/16" x 1⅜" long lag screws. Note that the 2"x 4" is notched out to fit over piece No. 4.

Now the stand is ready for grinding the rough spots. A lead or zinc oxide paint is suitable for a base coat and any outdoor paint can be used for a finish coat.



NO	DESCRIPTION	SIZE	MATERIAL	REQ
1	Mounting Block	2"x 4"x 13"	Wood	1
2	Mounting Plate	⅜"x 3"x 12"	Mild Steel	1
3	Lag Screw	5/16"x 1⅜"	Stock	2
4	Upright	⅜"x 30"	Light Tube or conduit	1
5	Upright Brace	½"O x 17½"	" "	2
6	Large Base	½"O x 58"	" "	1
7	Small Base	⅜"O x 12"	" "	1

Strictly Personal

ABOUT YOUR FELLOW TEACHERS

FRED STRICKLER, dean of Bennett College at Bradley University since 1947, has submitted his resignation, effective April 30, to accept the position of education director of the central division of the National Association of Manufacturers.

ARTHUR C. WENZEL, former member of the industrial-arts faculty at California State Teachers College, Pa., recently was appointed Dean of Men at Shippensburg, Pa., State Teachers College, effective at the beginning of the present semester.

CLAUDE NIHART, head supervisor, vocational and practical arts, Los Angeles city schools, has retired after 45 years of service in the field of industrial arts in the public schools.

FRANK M. BRUCE, treasurer of the Bruce Publishing Company and, with his brother, WILLIAM C., founder of the *Industrial Arts* magazine, now known as *Industrial Arts and Vocational Education*, died February 22.

GEORGE MCKENZIE, supervisor of trade and industrial education for the Los Angeles, Calif., city schools, will retire June 30.

DUKE MADDERN is retiring from his position as supervisor of industrial arts education, Oakland, Calif., city schools, effective June 30.

ERNEST W. RIDER, supervisor of practical arts in the Bridgeport, Conn., public schools for 30 years, died in January. He has been succeeded by EDWARD P. STACH, former acting supervisor of practical arts.

MILFORD M. HAMLIN has retired as assistant manager, department of education, American Type Founders, Inc., Chicago, Illinois.

DONALD L. POUND has resigned his position as director and coordinator of industrial education at Hobart, Indiana, to accept the position of assistant professor of industrial education at Indiana State Teachers College, Terre Haute.

J. DOUGLAS WILSON, curriculum consultant for the Los Angeles, Calif., city schools, is retiring June 30.

CHARLES CARLOCK, former building trades instructor at Hobart, Indiana, has been appointed coordinator of industrial education, following the resignation of Director Pound. ★

Front Cover Story

GREAT interest was developed in Tulsa, Oklahoma, following a television program covering the machine shop in the Central High School. This program was one of a series produced during American Education Week and won acclaim as one of the most interesting of the 18 programs presented.

As the camera moved about the shop, the instructor, H. E. Miller, was interviewed by the TV announcer who asked questions about the work being done and about the industrial-education program in the Tulsa schools. M. J. Ruley, Tulsa supervisor of industrial Education, states that this was a very effective device for interpreting the work in industrial education to the citizens of the community. The cover photograph is by Bob McCormack.

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while, went ahead with its hearings without benefit of ex-Commissioner McGrath. Senator Thye (R., Minn.) presided. He received witnesses courteously, but subjected them to that gentle art of torturing known only to Capitol Hill.

The ordeal of Kenneth W. Ingwalson, representing the American Farm Bureau Federation, was typical. Like other witnesses who appeared before and after him, Mr. Ingwalson stressed the importance of vocational education and pleaded for a return "to the 1953 levels."

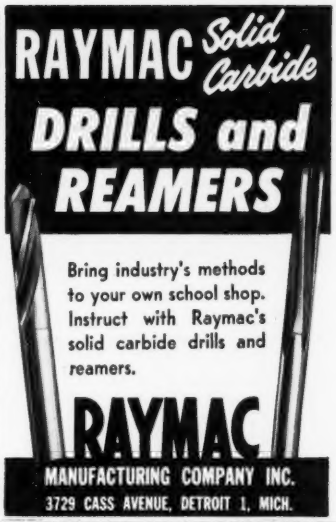
The presiding Senator would then ask: "Since you know as well as we do in Congress that the people are demanding economy, just what appropriations requests would you cut, if you were chairman of this committee? Where should the savings come from?"

If the witness was bold enough to suggest that some cuts might be made in the billion-dollar items scheduled for the Defense Department or the Veterans Administration, the chairman would say: "Fine, just what items in defense would you have us cut?" Here is an impossible question, which can be answered only by the Bureau of the Budget or by the Senator who asks it. But nearly every witness testifying in favor of vocational education was confronted with it because the presiding Senator knew it cannot be answered by a layman.

Witnesses were also badgered by the assertions that the states are in better financial position than the federal government. "Can't the state of Arkansas (or Georgia or Wisconsin) absorb the few thousand dollars which it gets from the federal government," Senator Dirksen (R., Ill.) kept asking, but what he meant was can't the states do without their federal share and still carry on vocational programs.

Destruction of the System?—Then the venerable Senator George (D.) from Georgia took the witness stand. He spoke bluntly. He said that the cuts recommended by the Bureau of the Budget were incredible, unsound, unsafe. He could only conclude, he said, that the Bureau of the Budget has a well-defined purpose in mind of destroying the vocational-education system.

"I'm certain," said Senator George, "that these reductions do not reflect the thinking of President Eisenhower, for the President has praised our federal-state partnership of financing vocational education. I cannot believe that he has had time to analyze the Bureau of the Budget figures. These figures, if accepted, will have a serious demoralizing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effect on the teachers in public vocational schools."

Senator George will probably rally other lawmakers to his side who believe in federal aid for vocational education. But whether this group will be able to withstand the pressure from the Bureau of the Budget on one side and from the Congressional economy bloc on the other will become evident only after the appropriations measures are brought to the House and Senate floors for debate.

The Handwriting on the Wall?—The Bureau of the Budget cut is not to be taken lightly. It is the first action in an effort to end federal payments for vocational education. The second action is already under way. This has taken the form of a plan to "reappraise federal-state relationships." Before this reappraisal can take place, Congress has to create a commission for studying federal-state relationships and this commission will take a year to do its work.

But already its conclusions are foreshadowed. The idea behind the commission is to pave the way for taking the government out of such cooperative efforts as providing school lunches and aiding vocational education.

Mrs. Hobby has given the tip-off. In one of her first public statements she said that her department is examining its policies to see what major changes "would enable the government to do its job better and for less money."

She added: "Ninety-three cents of every tax dollar appropriated to my department goes back to the states and local communities. . . . Grants-in-aid (from the department) provide financial assistance to universities. . . . public vocational schools and other programs administered by the states and local communities. The question arises: could any of this work be done more economically and more efficiently if the states themselves assumed more responsibility?"

Translated, this means: Cannot the vocational grants-in-aid be taken off the federal government's back? Cannot the states themselves pay for their vocational-education systems?

The philosophy of the present administration is to answer these questions in the affirmative, regardless of the Smith-Hughes and George-Barden Acts. ★

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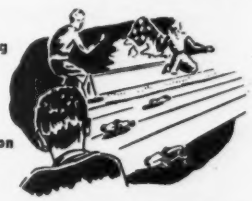

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Mr. McGrath Takes a Trip.—In the forenoon of April 22, Earl J. McGrath folded a dozen copies of an identical letter, stuck them in his pocket, took a cab to the White House with the intent of seeing President Eisenhower.

Unable to get an audience, Mr. McGrath left one copy of the letter with a White House secretary, mailed another to Mrs. Oveta Gulp Hobby, Secretary of the Department of Health, Education, and Welfare, and took the remaining copies to the major newspaper offices in town.

By 11 o'clock in the morning, Mr. McGrath was through with his errands. He went home, no longer U. S. Commissioner of Education.

"Dear Mr. President."—Mr. McGrath's letter was addressed to "Dear Mr. President." It began:

"I wish respectfully to submit my resignation from the office of U. S. Commissioner of Education. . . . I consider it desirable to withdraw in protest at this time because the budgetary actions of the government have in the past few weeks deeply cut into the program of this Office and have markedly damaged the morale of a highly competent professional staff. . . ."

Mr. McGrath then recounted for the President the story already known to SCHOOL SHOP readers: How the Korean GI Bill placed on the Office of Education (in McGrath's opinion) an obligation to set up a Veterans Educational Services division; how it was necessary (in McGrath's opinion) to spend $259,000 to finance that division even though the funds had not been appropriated but only promised by the Truman Administration; how the Republican Congress refused to make good that deficit; and how (again in McGrath's opinion) it was therefore necessary to lay off nearly 75 people and place the rest of the Office of Education staff on four- to six-day furloughs.

"If there were hope," McGrath continued, "of substantially larger funds for 1954 the damage already done might at least in part be repaired. But the budget which the Bureau of the Budget now allows for the next fiscal year includes additional reductions which will further damage the program of the Office of Education. . . ."

Vocational Funds Slashed.—What further reductions was McGrath referring to? On April 21, one day before his resignation, McGrath was shown a set of figures which were disconcerting to him. They showed that the Eisenhower Administration was planning to cut funds for vocational education by some 25 percent. That is, where the Truman Administration had asked Congress for $18,600,000 for 1954, the Eisenhower Administration was asking no more than $14,048,000.

Agricultural education was to take a cut of 30 percent, from $6,889,084 to $4,764,479; home economics was to take a cut of 30 percent, from $5,555,323 to $3,870,209; trade and industrial education was to take a cut of 29 percent, from $5,603,852 to $3,959,522. A minor cut was also to be taken by the territories in their share of vocational education. And only distributive education was to have its allotment increased, from $450,000 to $1,279,646.

These were some of the reductions which were shown to McGrath by Bureau of the Budget officials. And he was required to appear on Capitol Hill the next day to testify *in favor of them.*

That gave McGrath an opportunity to end his letter of resignation with these words: "I cannot in good conscience be a party to the carrying out of such a policy (of reductions), and therefore submit my resignation in order not to have to undergo the embarrassment of trying to defend before the Senate Appropriations Committee a budget which I consider indefensible."

The Gentle Art of Torturing.—The Senate Appropriations Committee, mean-

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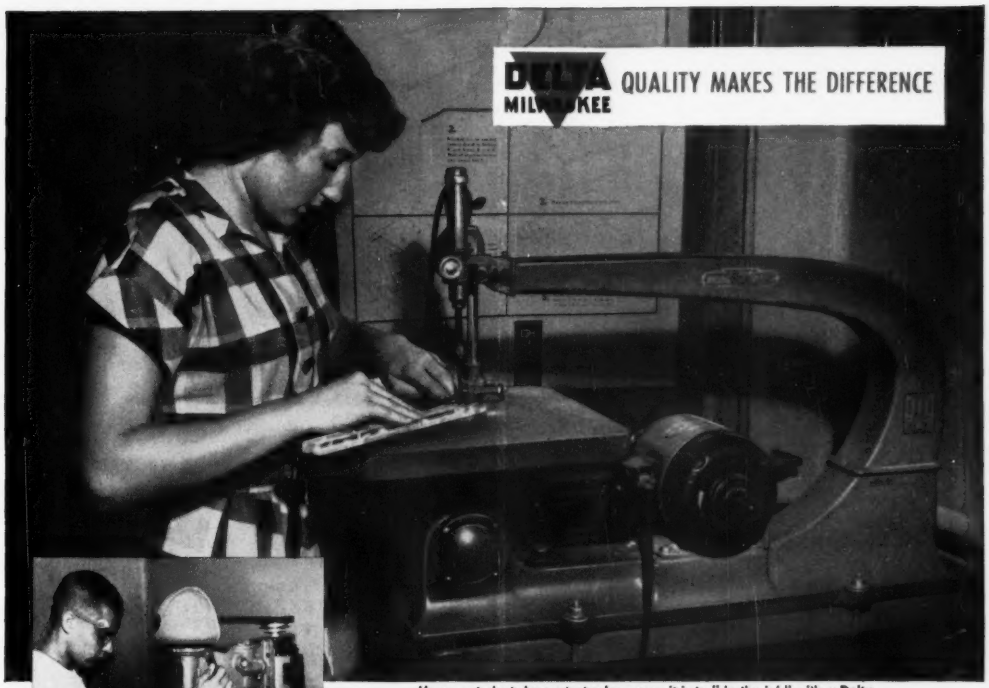

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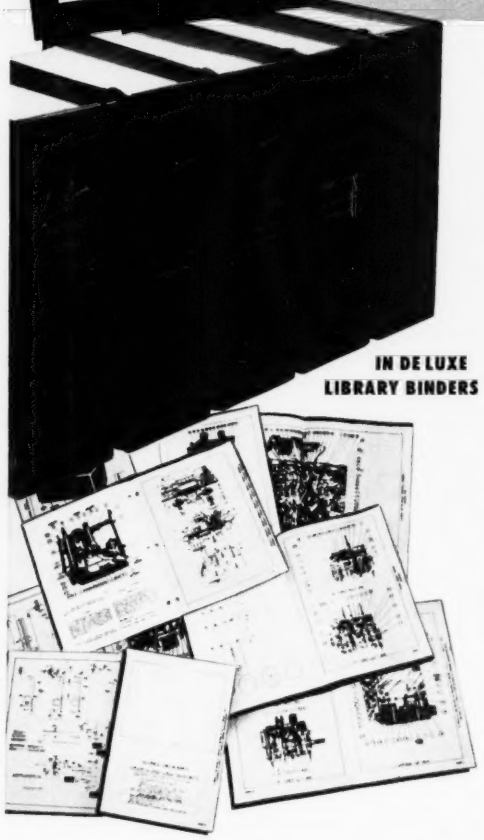

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